New York Notebook, N-85-10-01

This notebook covers the period October 1885-November 1886. Most of the entries are by Edison. Included are notes and drawings relating to the telephone and phonoplex, electric power distribution, lamp experiments, a thermostatic regulator for heating houses, a kerosene lamp for railroads, and a snow clearing machine. There are also measurements, calculations, and tables labeled "horizontal force"; notes on thermoelectricity; building plans for a new laboratory; and a list of items wanted by the Railway Telegraph and Telephone Company. A few entries on the telephone and phonoplex are by John F. Ott, one entry on the telephone is by Ezra T. Gilliland, and one entry on the phonoplex appears to be by Alfred O. Tate. Many of the entries were witnessed by Ott and Martin Force. The inside front cover was signed by Samuel Edison. The book contains 280 numbered pages.

Blank pages not filmed: 70-75, 90-91, 122-123, 152-153, 168-173, 176-181, 204-209, 234-235, 244, 247, 268, 271.

Missing page numbers: 133-136, 213-222, 227-232, 245-246, 251-264, 269-270, 277-278.

N-85-10-01

Samuel Edison

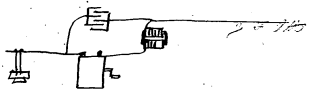
No 40987
ARTHUR & BONNELL
MANUFACTURERS
55 CEDAR STREET
New York

N-85-10-01

1

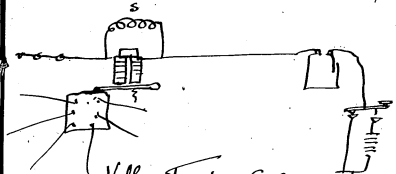
Oct 1 1885

T.A.E.



Device applied to Telephone ringer so it will dull waves and prevent them being heard in Telephone, wks ok (?) by Gillland

T.A.E.
E.T.

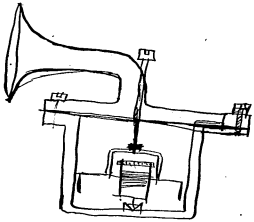


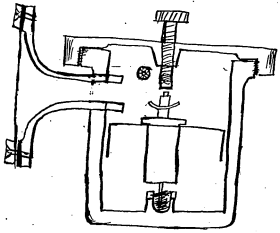
Village Telephone System

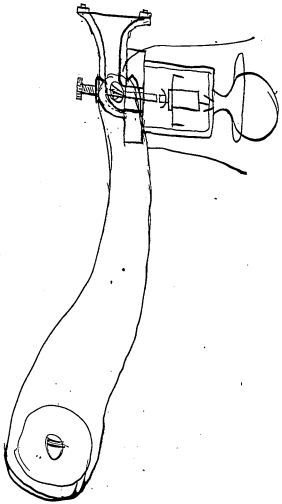
Shunt around releasing magnet on commutator switch connected to retard the present magnets coil waves from acting on it

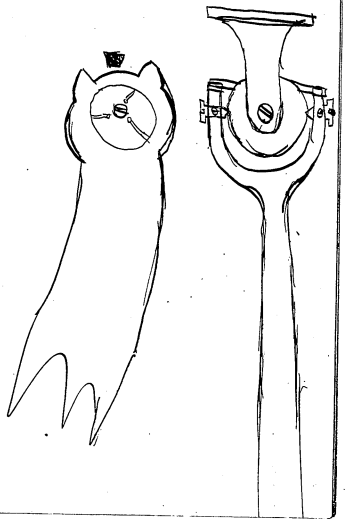
ok (?) by Gillland

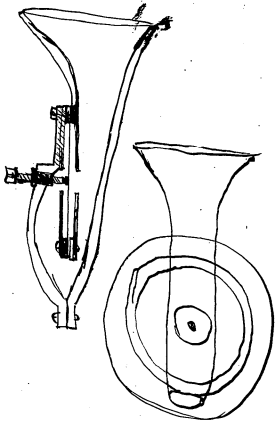
T.A.E.

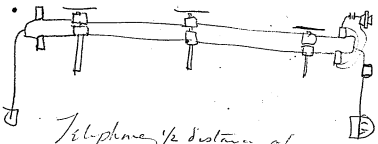












Telephone ½ distance of
metallic circuits with no induction
makes 4 times louder –
Receiving phones differential
as to induction currents
but ok as to talking
currents from induction coils
opposite direction

Nov 11 1884 – J.S.D.

TCE

Railroad Flagh Tree 6

Wants standard forms of

Couplings for Car Drafts

Battery boxes - tank freezing.

Drawing Instrument for Cap or Hand gear -

Drawing Instrument for left hand -

Combination Switch, Independent -

Thompson-Houston Dec 10th
Indpls [illegible]
leave Sunday night or

Ship at Portland Me Dec 10 or 11th
probably leave tomorrow

Double Contact Rods

Coils made on stand and base boards with spring connections –

Mem –

Contacts to the ground connection brushes should be made of some flexible cord with a covering that will stand the dirt and grease – The Rubber wire used at present dries up and cracks –

The table showed some screws in the foot the

screws should be pointed to serve the double purpose for dwelling and permitting table sliding around -

Contact plugs for connecting roofs of cars together should be made so that they will pull out, in case cars are uncoupled without unhooking or disconnecting the cords —

The combination switch should be placed on the left hand side of table and should be arranged so that one movement moves all the switches -

R.R. Continued

About 1/4 size

Continuation Sketch

Did 12 ~~8~~
J. F. ~~Oso~~
M. A. Pore

Coils

Switch. throw
2 3 4 5 + 6,
cells quickly.

Primary -:

✓ 1. 7 ohm coil.

2 cells 3 cells 4 5 + 6 cells -

✓ 1 3 ohm coil

2 3 4 5 + 6 cells

✓ 1 . 2 ohm Coil

Same cells.

✓ 1 , 1 ohm coil

✓ 1 .40 coil wound so as to be same size as the 7 ohm Coil in diameter + length

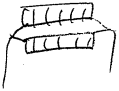
✓ 1 14 ohm Coil

Dec 12, 05 Reg 7 ohm length.

J. S. Cuth

Mr. Fox 2. 3 ohm Coils

Multiple arc



✓ 2 7 ohm multiplarc

✓ 2 14 " "

all tied with the 2 745-96 coils —

✓ 2 - 2 ohm in Series

✓ 2 3 " "

✓ 2 7 " "

✓ 2 14 " "

Dec 12. 85

~~5~~ 7 OH
Brass

Condenser across
~~the~~ vibrator to be
varied ~~[illegible]~~ first
& then 16 32. 48.
72. 100.
Each experiment

J. S. Ch

~~[illegible]~~ M. B. F.

Secondary.

Regular telephone Coil varying battery, or varying bulbs then, The three large Coils then. The several varieties of small coils with low resistance secondary & also high resistance primary.

Try all these Coils, etc at the station on Table having two or 3 sets set up - and while Experimenting

one being tried on one
set another is being
got ready Thus with
3 sets or even two
the Experiments can be made
Continuous —

During the Experiments
the Condenser devices
etc for getting rid of
induction & also for
Commutating to the line
must remain undisturbed

Dec. 12. 85
J. T. Otto
MNF

Dec 12 85

~~Then~~ J. S. Ott

A thorough understanding must be had with the train man so he records the Expunting. an other man should be with him & have a telephone & he should record his impressions independent of the other man —

The nature of every change made at the sliding station should be telegrd to train so the two persons Each of whom have a telephone to Ea

Can reach them & giving them time to record their impressions as to loudness etc =

One man should watch the record at the sender (Clarke ~~etc~~ keeping it at same tone which he can do by adjusting & using ~~a tuning~~ a tuning fork —

After the best form of

Mint

Coil ~~&~~ Condenser & Battery is established – another trip should be taken using these forms only and variations in the reed & Condensers etc gone through – to ascertain what improvement can be made in these devices –

Each Experiment of Coils etc should be numbered & these numbers tabulated so all these persons involved

record the same
Experiment,
After all these Experiments
& the best form of Coils
Batteries Condensers
Note in need Commutator
to have - the you
might make ½ doz
morning telephones of
different resistance
& test them

Dec 12 85

J. F. Ott
MMF

R.R. Exp. continued Jan 7th 86.

J. S. Hamilton

List of Induction Coils to be tried.

Regular sized coil is 3 3/4 in. long by 1 3/8 in. in diameter, with 1/2 in core diameter.

(#1) Single, regular sized 1. ohm primary coil. diam wire .041 —

(#2) Single, regular sized 2. ohm primary, diam. wire .035 —

(#3) Regular sized 3 ohm primary, diam. wire .031 —

(#4) Regular sized 4/100 ohm primary diam wire .050 —

J. T. Watt Jan. 7th 86.

(#5.) Regular sized 7 ohm primary diam wire .023

(#6.) Regular sized 14 ohm primary diam wire .020

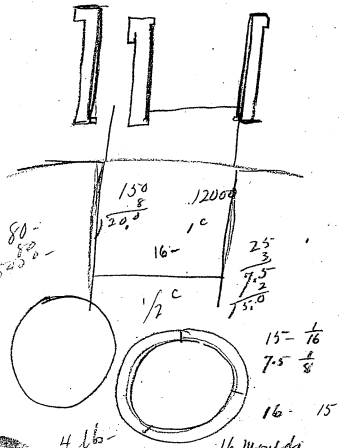
(#7) Two regular sized 3 ohm primary Coils multiple arced. diam wire .031

(#8.) Two regular sized 7 ohm pri. Coils multiple arced. diam wire .023

(#9) Two regular sized 14. ohm pri. Coils multiple arced. diam wire .020

(#10.) Two regular sized 2 ohm pri. Coils in Series. diam wire .035

(#11) Two regular sized 3 ohm. pri Coils in Series. diam wire .031



J. S. Sp. Jan 7. "86.

(#12.) Two regular sized 7. ohm pri. Coils in Series. diam wire .024

(#13.) Two regular sized 14. ohm pri Coils in Series. diam wire .020

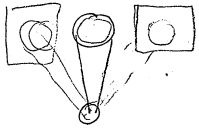
(#14) Single Coil. Length 2 in. Diam 3 3/4 in. Core diam. 1/2 in. Primary pri is 6.05 ohms. Layers 15 of .032 wire. Secondary pri is 70.75 ohms. Layers 22 of .015 wire.

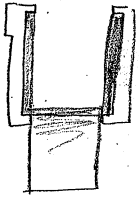
---

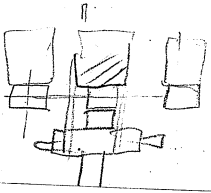
15 5 grs each

36) 150 (4 lbs -
144

3.6
4 5 0
2 8 8
1 4 4
1 7 2 8.0



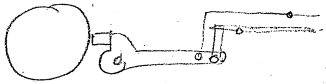




9.5.84 Jan 7 '86

(#15) Single Coil. Length 3 5/8 in.
Diam. 4 1/8 in. Core Diam 3/4 in.
Primary resis 1.23 ohms
Layers 14 of .061 wire
Secondary resis 77.5 ohms
Layers 32 of .020 wire.

(#16) Single Coil. Length 3 1/2 in.
Diam. 4 1/8 in. Core Diam 3/4 in.
Primary resis. 4.25 ohms.
Layers 20. of .041 wire.
Secondary resis 78. ohms
Layers 24 of .014 wire



(#17) Single Coil. Length 3½ in.
Diam 4¼ in. Core diam 1½ in.
Primary resis 4.25 ohms
15 layers of #18 B.&S. wire.
Secondary resis. 78 ohms.
20 layers of #24 B.&S. wire.

(#18.) Single Coil. Length 4 in.
Diam. 1½ in. Core diam ½ in.
Primary resis. .030 ohms.
Three .045 wires multiple
Secondary resis. 125 ohms.
Diam wire .008

J. F. H. Jan 7. 86.

(#19.) Three regular sized Coils with primaries in multiple & secondaries in series

Total primary resis. .130 ohms
Diam wire .042

Total secondary resis. 1537. ohms
Diam wire .005

(#20.) 74/110 ohm primary Coil.
Length 7 in. Diam. 2 in.
Core diam. 1 in.
Diam wire .089

(#21.) J. F. Hitt Jan 7th 86.

Two Coils with primaries in multiple & secondaries arranged able to be connected in multiple or series. Length of each 1½ in Diam 3½ in. Core diam ⅞ in.

Total pri resis 1.60 diam wire .025

Sec. resis 56 + 54 ohms. diam wire .014

(#22.) Two primary Coils in multiple, each of 15 layers, divided in 7 sections of 2 layers & one of one. Length of each coil 1½ in Diam 3½ in. Core diam ⅞ in. diam wire .025. Resis of one 3.14 Resis of other 3.98 ohms.

J. F. Ahs Jan 7 '86

(#23.) Single Coil. Length 4 in.
Diam 1 1/2 in. Core diam 1/2 in.
Primary resis 7 ohms Layers 7 of .022 wire
Secondary resis 150. diam wire .019

(#24) Single Coil. Length 5 3/8 in.
Diam 3 in. Core diam 3/4 in.
Sec. resis 1858 ohms
Layers 38 of #32 B & S. wire
Different Primaries.

Jan 14, 85 J. S. Pk

Two Cast Iron Telephones,
with adjustible cores, in with
caps, such as used in,
Telephone Exchanges,

Two Thousand to be used
as hand phones
with diff thickness diaphrams

One Bergman receiver,
with large shell, resistance
124 Ohms

One Condenser
6 x 10 with 8 sheets
connected so as to use
from one to 8 sheets

Jan 26. 85

Made From Telephones same as used by Telephone switch men, with soft iron cores of diff sizes, made of very fine Iron wire

J. T. Titt

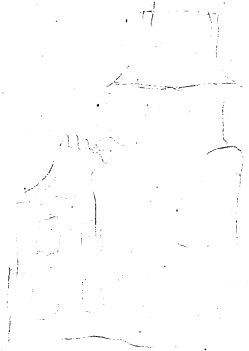
~~Eff~~

Delivered to Mr. RK [illegible]
2 long distance telephone transmitters for [illegible]
per pass - Jany 27 -

Jan 30. 86

Delivered to R. T. [illegible] one complete cabinet.

[illegible]



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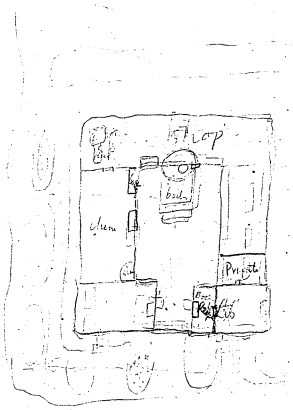
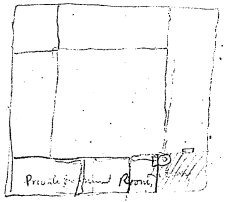
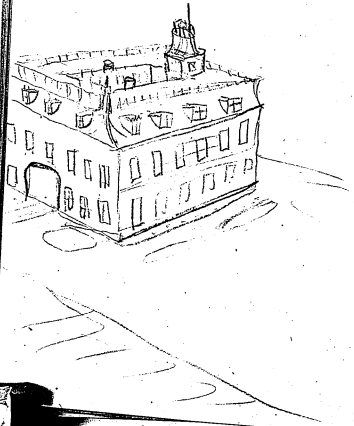
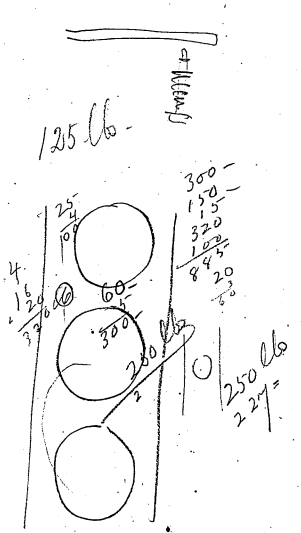
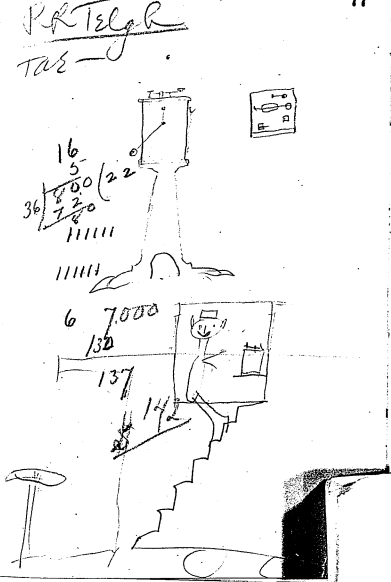



Pressure
Ground
Gong




125 lbs
300
150
15
330
100
885
20
25
10
4
16
20
370
60
5
300
200 lbs
2
250 lbs
227


16
5
36
22
6
7000
132
137

006.

50 .25

25
300
125

10

10
25

12

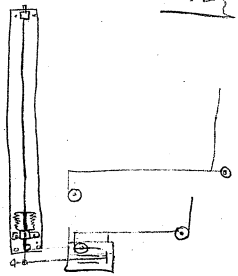
6 25
3 100 to foot

1/4

1/2 12.

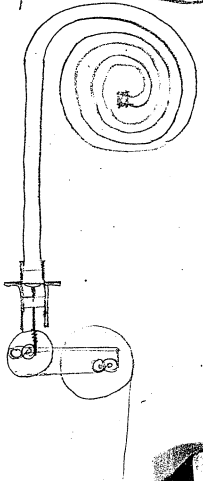
45 deg 15/1000.

Regulation temperature House
by Engineering Tuesday 3rd 1886
TAY

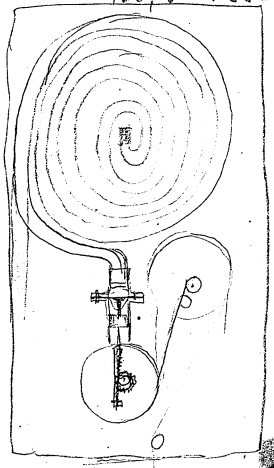


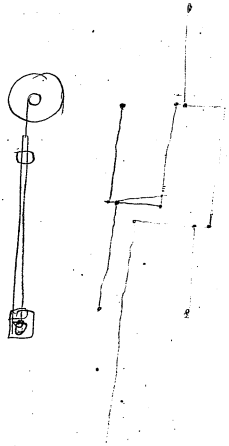
6

Regulator temp of Hamea by Expansion Tube by 3 0 1550 70 F

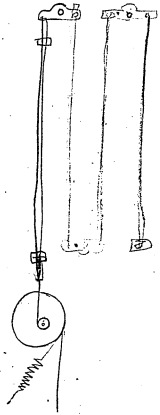


Regulating Temperature House
by Expansion Engine —
T. B. Gray 3rd 1886 Tacy

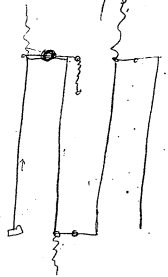




Regulator Compensation
Hand — Feby 3rd 1886
Trace



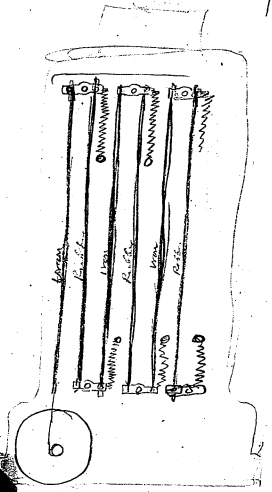
Regulerbem Cämpa [illegible]
Handa Fäby 3rd 1886
JAR



Regulating temperature Hand

Feby 3rd 1886

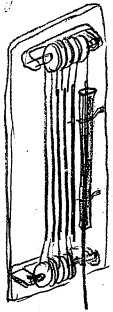
TAE



Feby 3rd 1886 TAE

Compensating Hand Regulator

Rods so expanding as regulate heat and cold in transit



Expansion Zinc

1 in 336.

Iron – 1 in 846.

glass 1 in 1248

water increases $\frac{1}{9}$ in

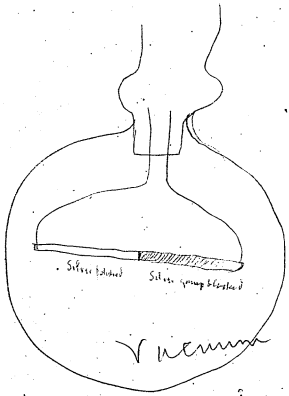
bulk from 32° to 212

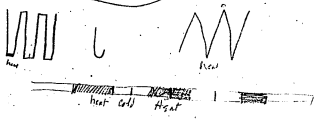
Mercury $\frac{1}{63}$ –

12 –	336
6 –	168.
3 –	84
1½ –	42.

Gave instructions to John Att. to make another wick between the 2 wicks of the Regular Sperm oil hand lantern used on Railroads. This central wick dipping into a reservoir of Kerosene with the oil can = This will save them trouble = the bothering of the lamp, cannot blow out & is very cheap

also to use in reg Kerosene lamp a capillary space flat & adjustable, so Kerosene is burnt then object without wick by capillary action





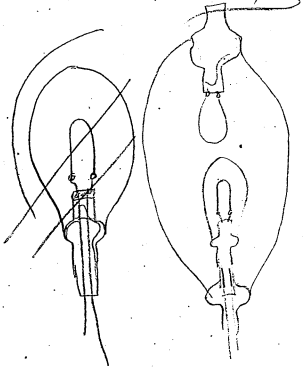
Theory is that one junction blackened absorbs heat, other polished reflects heat) —

Thermo

Feby 6 1886

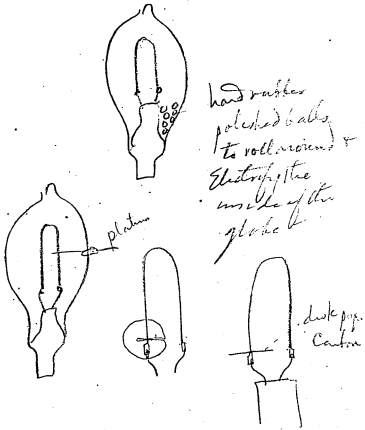
Radiant heat & light

Lamp factory Experiments
Feby 6 1886 TAE

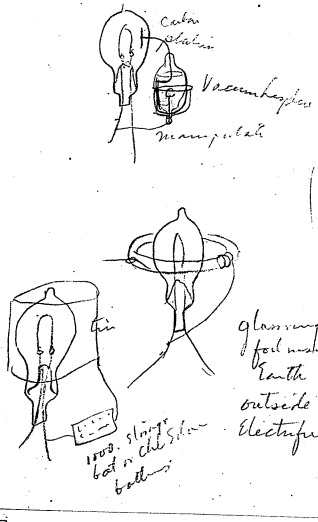


One lamp within the other

February 1886 T.A.E.

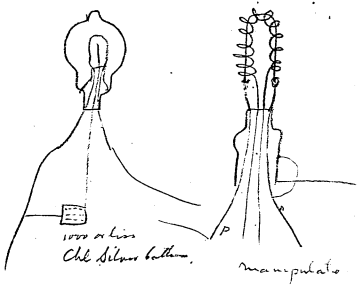


Feby 6 1886 TAE



Spring Catalogue

Feby 6 1886 T.C.E.



Very fibres cut from ferns stalks, they are palms

also orchid flower sticks

Friday 18 Oct 1748

Roll Licorice out in sheets and Cantonizi. — dip paper in hot liquid Licorice; scrape dry + cut regular

ground the fine Canton Lump black up with Licorice; roll in sheets + stamp out, —

Boiled Glycyrrhiza deprived Brown, in Liquid —

87,000	87,000
40,000	30,000
50,000	80,000
100,000	500,000
50,000	200,000
75,000	580,000
20,000	500,000
40,000	50,000
20,000	100,000
	40,000
482,000	2,167,000

455000
42000
87000

6

10

95
85

77

42

19

92

6

Feby 6 1886 Tag

Fabric boiled in licorice =

Torpedo wire

Finest linen, Balata.

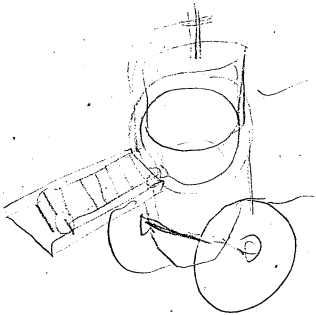
Linen braid - lined

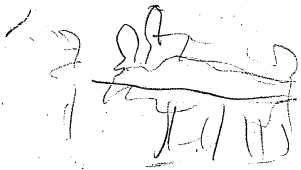
Steel wire

kind very thin

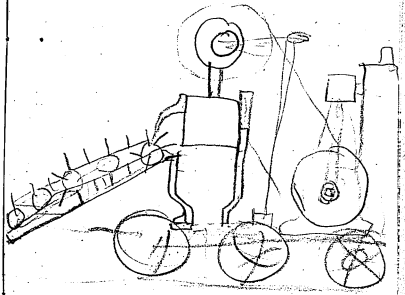
Anything Celluloid Elastic as possible - fine relay wire + central phosphorus - whip cord braid -

Feby 6 1886 Tues





Fabry le 15/8/6

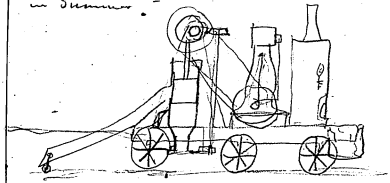


Feby 6 1886 TOE

St Cleaning -

Machine for gathering snow & compressing it to ice or dropping definite blocks in gutter as horses advance apparatus

Block ice being used for Refrigerating cars in Summer.



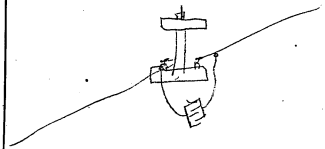
Feby 12 1886

Phonoplex

Wound a 7 ohm or less coil
with bare wire with hard
thread very much spiraled
so as to give nearly all air
space between wire so coil
will charge + discharge
quicker ~

Feby 12 1886 TAE

To obviate induction
arrange condenser thus

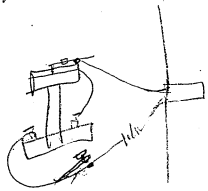


graduate the Condenser so that it will allow regular Current to lift weight but not the induction Current.

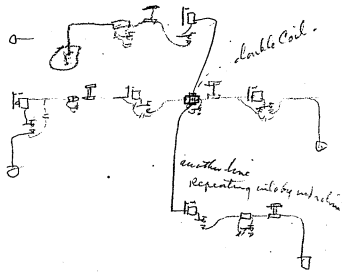
Feby 12 1886

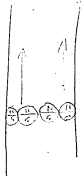
Phonoplexer

Try these for vibrators for
Rth relays



Feby 12 1886
Tait

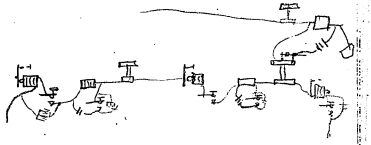


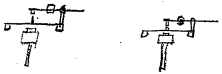


Feby 12 1886

Tat

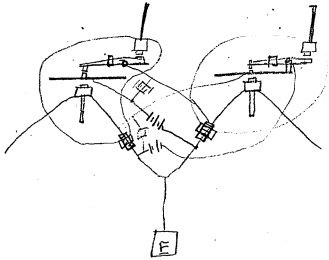
Phonoplex Repeating



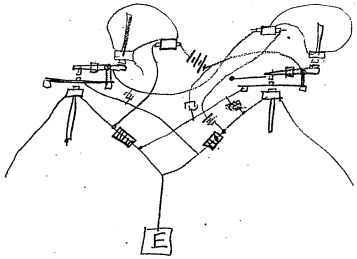


Feby 12 1886

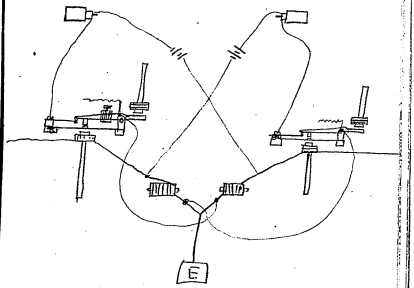
Rhomoplex Repeater

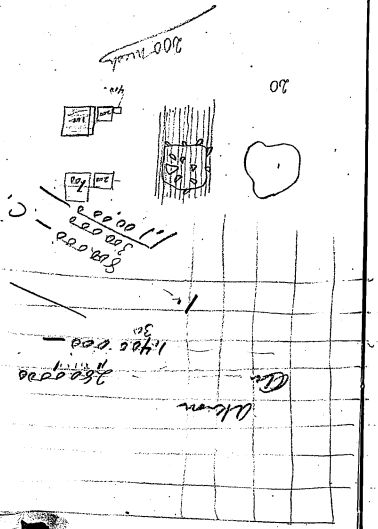


Feby 12 1886 Phonaphus Repeater



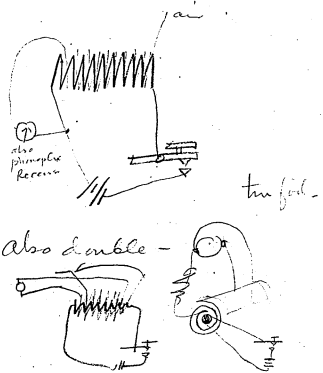
Feb 12 1886 Tat
Phonoplex Repeater





Feby 12 1886 Tues

Induction coil + condenser
Combined Exp'mt



			$\frac{1}{4}$
		$\frac{1}{2}$	$\frac{1}{16}$ cubic $\frac{1}{64}$ block
		$\frac{1}{2}$ to $\frac{1}{4}$ surface	$\frac{1}{8}$ block
		$\frac{1}{8}$ cubic	
		$\frac{1}{12}$ block	
		$\frac{1}{16}$	

			$64\frac{1}{4}$
		1	$\cancel{256\frac{1}{4}}$
		$\frac{1}{2}$	$\frac{1}{4}$
		1	
$24\frac{1}{2}$	$6\frac{1}{2}$		
$96\frac{1}{4}$	$24\frac{1}{4}$	$6\frac{1}{4}$	Surface

Sphere $1/2$ a Lost electricity

Small diameter of sphere or $\frac{1}{4}$

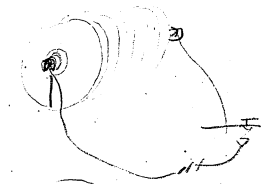
$\frac{16}{96}$		
$\frac{16}{256}$	Lost $\frac{1}{4}$	Small block
		$96 - 64$
		$24 \quad 8$
		$6 \quad 1$

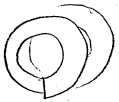
$\frac{1}{16}$

$\frac{1}{12}$ block

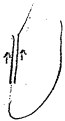
Feby 12 1886 Tal

Induction coil & Cardar Combined





paper with foil pasted on side wound spirally & double



105 - ohms 2 mf
210 " 1
420 1/2
840 1/4
1680. 1/8 -

3/16 -

5200 60.
7
60) 364.00. (600
360 60
4 360.00.

6)600 square feet,
60 - 1 1/50 -

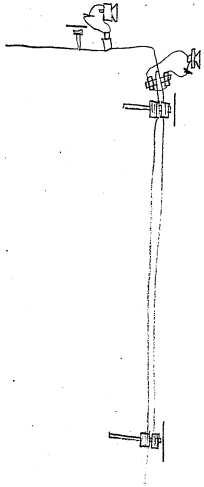
∴ 60 sqr feet.

.15 2.
7
105.

Feby 13 1886 TAE

Tri-phonoplex

Two phones are here employed with little attention a very small weight-function, two pendulums each of 7 ohm each have local battery one is superior phonoplex another the other a very sensitive microphone. The main point is the use of condensers to give sharpness, the second the Wheatstone system of transmitters, the third the use of the Telephone with the light weight of the diaphragm which the light weight on its stiffness gives the sudden stamp after the voice phone has ceased to strike the water.



Western Union Telegraph Company

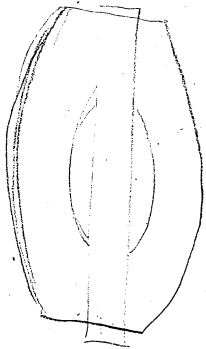
Northwestern Telegraph Co

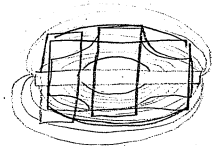
Licking Valley

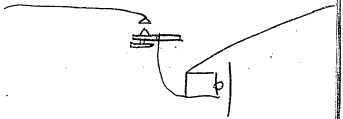
Northwestern Telegraph Co

Wabash Valley Railroad

Lorenzo Dow






b

4 × 16) 520 (32.5
48
40
32
8

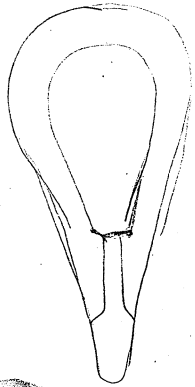
16) 212 (13.1/4
16
56
48
4

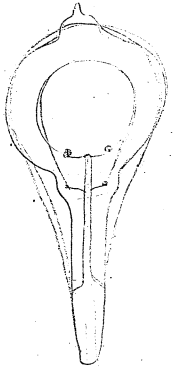
16) 100 (43.
64
60
48
12

32.
25
5
250
125.00

16) 1000 (62.5
96
40
32
8

32) 712 (22.
64
152
128
24




G

mg
7000 ~~g~~ grams 1 solution

1 mg 1/7000
14 pints
28000
56 0095.

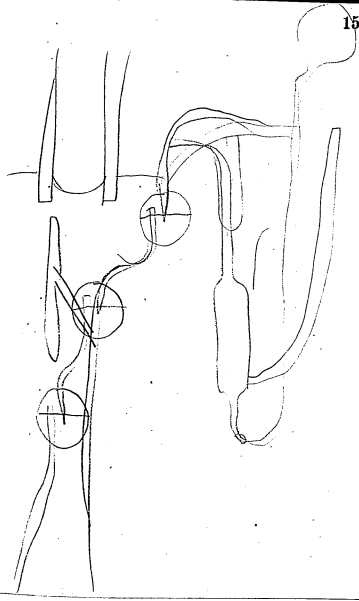
1/2
1/4
1/16

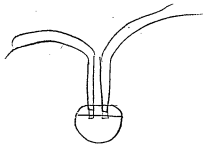
16
90
15
240

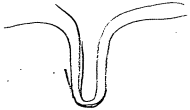
2 3
32
64
96
1024

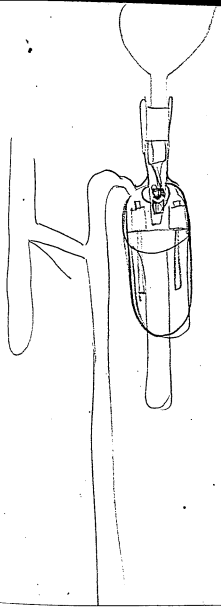
2 90 450

240 . 29000/L









10,000,000) 2 000 000 (200000

40 / 70 000 (1750
400
300
240
200
200

40 / 20 000 000 (5 000 000
40
20 000 000

50

40.

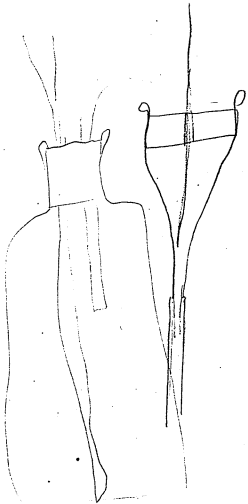
4. 0 0 0 0 0 0 0 0 0

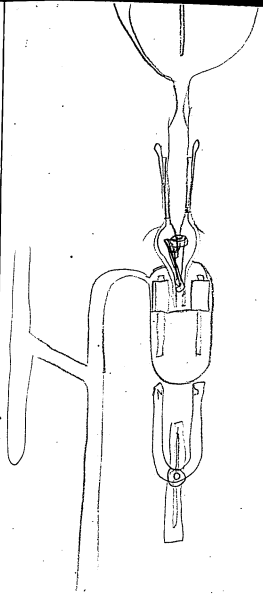
40 Billion Water with 2 pot Soy

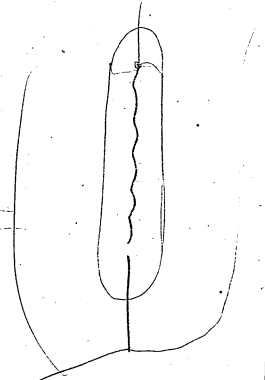
10,000,000,000 glass

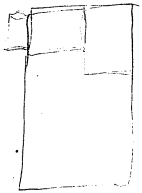
2. 0 0 0 0 0 0 0 0 0

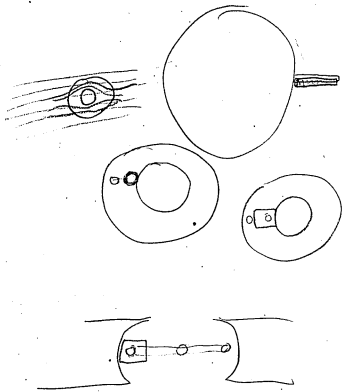
7,000,000,000





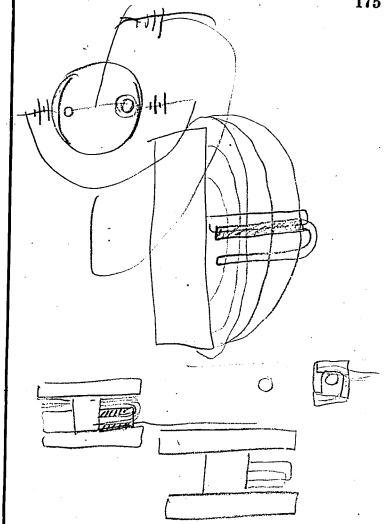


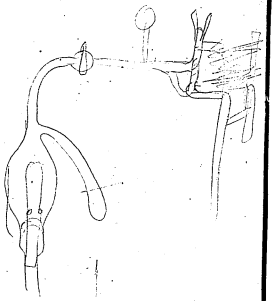


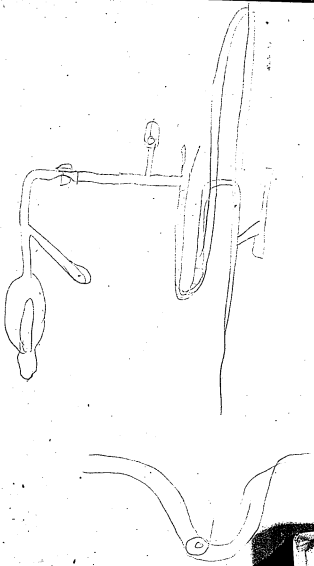


40 50

20 times as much







Horizontal force – Del

66.65 Zero

0 millimeter	1 mm	2	3 mm
8.14	7.87	6.97	5.83

4	5	6	7	8	9
4.66	3.25	1.94	.59	Zero	.37

10	11	12	13	14	15	16
.69	1.39	1.84	2.09	2.78	3.03	3.47

17	18	19	20	21	22	23
3.50	3.92	4.41	5.57	6.18	7.10	7.87

7444
6665
8.14

7222
6665
5.57

7283
6665
6.18

7106
6665
4.41

7371
6665
7.10

7462
6665
6.97

6968
6665
3.03

6874
6665
.209

7012
6665
.347
6702
2.78

6943
6665
6849
6665
1.87

7248
6665
5.83

7131
6665
4.66

7257
6665
3.92

6724
6665
.59

7015
6665
3.50

6734
6665
.69

7452
6665
7.87

6859
6665
1.94

6804
6665
1.39

Gamma

Zero 5366

0	1	2	3	4	5	6
9.20	9.17	8.26	6.65	4.87	2.99	1.79

7	8	9	10	11	12	13
.78	.14	Zero	.10	.03	.64	.74

14	15	16	17	18	19	20
1.16	1.61	2.21	2.23	2.42	3.17	4.73

21	22	23
6.20	7.51	8.56

6286
5366
9.20

6283
5366
9.17

6192
5366
8.26

6031
5366
6.65

5853
5366
4.87

5665
5366
2.99

5543
5366
1.79

5444
5366
.78

5380
5366
.14

5376
5366
.10

5364
5366
.03

5486
5366
1.78

5527
5366
1.61

5587
5366
2.21

5589
5366
2.23

1.16

5986
5366
6.20

5839
5366
4.73

5608
5366
2.42

5683
5366
3.17

6222
5366
8.56

6117
5366
7.51

6

Feby H.F.

Zero 5057

0	1	2	3	4	5	6	7	8
9·29	9·22	7·50	5·20	3·55	2·48	1·07	·30	Zero

9	10	11	12	13	14	15
·23	·09	·85	1·28	1·98	2·14	2·24

16	17	18	19	20	21	22	23
2·45	2·63	2·77	3·19	4·49	5·88	7·18	8·35

5985	5949	5807	5577	5412	5275
5057	5057	5057	5057	5057	5057
9.28	9.22	7.50	5.20	3.55	2.18

5164	5087	5080	5066	5142	5185
5057	5057	5057	5057	5057	5057
1.07	·30	·23	·09	1.85	1.28

5254	5271	5281	5302	5320	5334
5057	5057	5057	5057	5057	5057
1.98	2.14	2.24	2.45	2.63	2.77

5376	5506	5645	5775	5892
5057	5057	5057	5057	5057
3.19	4.49	5.88	7.18	8.35

981
207
11.88

Zero 5264 HF March

0	1	2	3	4	5	6	7	8
9·81	9·59	8·65	6·83	4·83	2·93	1·58	·36	·31

9	10	11	12	13	14	15	16
Zero	·17	·37	·86	1·56	2·06	1·98	2·26

17	18	19	20	21	22	23
2·54	2·74	3·21	4·04	5·48	7·09	8·93

6245	6223	6129	5947	5747	5557
5264	5264	5264	5264	5264	5264
9.81	9.59	8.65	6.83	4.83	2.93

5422	5300	5295	5281	5301
5264	5264	5264	5264	5264
1.58	·36	·31	·17	·37

5350	5420	5470	5462	5490
5264	5264	5264	5264	5264
·86	1.56	2.06	1.98	2.26

5518	5538	5585	5668	5812
5264	5264	5264	5264	5264
2.54	2.74	3.21	4.04	5.48

5973	6157
5464	5264
7.09	8.93

Thomas Edison 1847-1931

zero -5172 HF April -

0	1	2	3	4	5	6	7	8	9	10
12.19	11.89	9.83	7.95	4.82	2.97	1.26	.38	zero	.21	.74

11	12	13	14	15	16	17	18
.94	2.06	2.64	4.74	4.10	4.27	4.70	5.02

19	20	21	22	23
5.47	5.98	7.46	9.40	11.30

6391	6361	6155	5867	5654	5469
5172	5172	5172	5172	5172	5172
1219	1189	983	795	482	297

5298	5210	5193	5246	5266	5378
5172	5172	5172	5172	5172	5172
126	.38	.21	.74	.94	2.06

5436	5546	5582	5599	5642	5674
5172	5172	5172	5172	5172	5172
2.64	4.74	4.10	4.27	4.70	5.02

5719	5770	5918	6112	6302
5172	5172	5172	5172	5172
3.47	5.98	7.46	9.40	11.30

12.19
1.1
13.39

5569 zero HF May

0	1	2	3	4	5	6	7
10.00	9.74	8.69	6.57	4.58	3.25	2.28	1.67

8	9	10	11	12	13	14	15
.89	.69	.38	zero	.06	1.77	1.77	2.29

16	17	18	19	20	21	22	23
2.68	2.88	3.29	3.35	3.95	5.18	6.92	8.83

6569	6543	6438	6226	6027	5894
5569	5569	5569	5569	5569	5569
10.00	9.74	8.69	6.57	4.58	3.25

5797	5736	5658	5638	5627	5575
5569	5569	5569	5569	5569	5569
2.28	1.67	.89	.69	.58	.06

5746	5746	5798	5837	5857
5569	5569	5569	5569	5569
1.77	1.77	2.29	2.68	2.88

5898	5904	5964	6087	6261
5569	5569	5569	5569	5569
3.29	3.35	3.95	5.18	6.92

6452
5569
8.83

74.3
74.2
77.0
3) 225.5
75.1

Zero 6042 HF June

0	1	2	3	4	5	6	7
7.90	7.76	6.21	4.25	2.71	1.65	.91	.20

8	9	10	11	12	13	14	15
.04	2.08	.57	.09	.29	.34	.45	1.16

16	17	18	19	20	21	22	23
1.31	1.27	1.87	2.32	2.54	3.56	5.21	6.87

6832 − 6042 = 7.90
6818 − 6042 = 7.76
6663 − 6042 = 6.21
6467 − 6042 = 4.25
6313 − 6042 = 2.71
6207 − 6042 = 1.65
6133 − 6042 = 9.1
6062 − 6042 = .20
6046 − 6042 = .04
6093 − 6042 = .51
6051 − 6042 = .09
6071 − 6042 = .29
6076 − 6042 = .34
6087 − 6042 = .45
6158 − 6042 = 1.16
6173 − 6042 = 1.31
6169 − 6042 = 1.27
6229 − 6042 = 1.87
6274 − 6042 = 2.32
6296 − 6042 = 2.54
6398 − 6042 = 3.56
6563 − 6042 = 5.21
6729 − 6042 = 6.87

130

9.85
7.90
17.75

2000 6361 HF July

0	1	2	3	4	5	6	7
8.69	8.34	6.71	4.90	3.31	2.14	1.30	.16

8	9	10	11	12	13	14	15
2000	.26	.35	.79	1.24	1.93	2.19	2.77

16	17	18	19	20	21	22	23
19	4.21	3.75	4.03	4.62	5.50	6.90	8.39
3.17							

7230 / 6361 / 8.69

7195 / 6361 / 8.34

7032 / 6361 / 6.71

6857 / 6361 / 4.90

6692 / 6361 / 3.31

6575 / 6361 / 2.14

6491 / 6361 / 1.30

6377 / 6361 / .16

6387 / 6361 / .26

6396 / 6361 / .35

6440 / 6361 / .79

6485 / 6361 / 1.24

6554 / 6361 / 1.93

6580 / 6361 / 2.19

6638 / 6361 / 2.77

6678 / 6361 / 3.17

6782 / 6361 / 4.21

6736 / 6361 / 3.75

6764 / 6361 / 4.03

6823 / 6361 / 4.62

6911 / 6361 / 5.50

7051 / 6361 / 6.90

7200 / 6361 / 8.39

7364 / 8.47 / 27.73

2000 7991 Aug HF

0	1	2	3	4	5	6	7
9.30	8.90	7.35	5.75	3.67	2.08	.99	.43

8	9	10	11	12	13	14	15
2000	.07	.52	.86	1.03	1.65	1.71	2.00

16	17	18	19	20	21	22	23
2.52	2.73	3.00	3.58	3.92	4.81	6.68	8.18

8921 / 7991 / 9.30

8881 / 7991 / 8.9

8726 / 7991 / 7.35

8566 / 7991 / 5.75

8358 / 7991 / 3.67

8199 / 7991 / 2.08

8090 / 7991 / .99

8034 / 7991 / .43

7998 / 7991 / 7

8043 / 7991 / .52

8077 / 7991 / .86

8094 / 7991 / 1.03

8156 / 7991 / 1.65

8162 / 7991 / 1.71

8191 / 7991 / 2.00

8243 / 7991 / 2.52

8264 / 7991 / 2.73

8291 / 7991 / 3.00

8349 / 7991 / 3.58

8383 / 7991 / 3.92

8472 / 7991 / 4.81

8659 / 7991 / 6.68

8809 / 7991 / 8.18

2934 / 7991 / 38.19

7798 HF Sept

0	1	2	3	4	5	6	7
9.69	9.67	8.50	6.74	4.82	4.04	1.19	.90

8	9	10	11	12	13	14	15
.21	zero	.48	.83	1.21	2.27	2.84	3.40

16	17	18	19	20	21	22	23
3.49	3.63	3.67	3.94	4.27	5.25	6.84	8.22

8767 − 7798 = 9.69	8765 − 7798 = 9.67	8648 − 7798 = 8.50	8472 − 7798 = 6.74	8280 − 7798 = 4.82
8102 − 7798 = 4.04	7917 − 7798 = 1.19	7888 − 7798 = .90	7819 − 7798 = .21	7846 − 7798 = .48
7881 − 7798 = .83	7919 − 7798 = 1.21	8025 − 7798 = 2.27	8082 − 7798 = 2.84	8138 − 7798 = 3.40
8147 − 7798 = 3.49	8161 − 7798 = 3.63	8165 − 7798 = 3.67	8192 − 7798 = 3.94	8225 − 7798 = 4.27
8323 − 7798 = 5.25	8482 − 7798 = 6.84	8620 − 7798 = 8.22		

2741
964
3710

Zero 7710 HF Oct

0	1	2	3	4	5	6	7
8.98	7.38	6.13	4.79	3.31	2.00	.83	.62

8	9	10	11	12	13	14	15
.12	zero	.05	.56	.78	1.41	1.77	2.35

16	17	18	19	20	21	22	23
2.40	2.56	2.60	2.71	3.65	5.18	6.97	7.91

8508 − 7710 = 8.98	8448 − 7710 = 7.38	8323 − 7710 = 6.13	8189 − 7710 = 4.79	8041 − 7710 = 3.31
7912 − 7710 = 2.02	7793 − 7710 = .83	7772 − 7710 = .62	7722 − 7710 = .12	7715 − 7710 = .05
7766 − 7710 = .56	7788 − 7710 = .78	7851 − 7710 = 1.41	7887 − 7710 = 1.77	7945 − 7710 = 2.35
7950 − 7710 = 2.40	7966 − 7710 = 2.56	7970 − 7710 = 2.60	7981 − 7710 = 2.71	8075 − 7710 = 3.65
8228 − 7710 = 5.18	8407 − 7710 = 6.97	8501 − 7710 = 7.91		

2653
898
3551

198 7229 HF Nov -

0	1	2	3	4	5	6	7
8.69	8.29	7.40	5.95	4.46	3.12	1.90	.69

8	9	10	11	12	13	14
.21	.00	.17	.59	1.16	1.64	2.12

15	16	17	18	19	20	21	22	23
2.80	2.41	2.69	2.88	3.42	4.58	6.02	7.13	8.08

8098	8058	7969	7824	7675	7541
7229	7229	7229	7229	7229	7229
8.69	8.29	7.40	5.95	4.46	3.12

7419	7298	7250	7246	7288
7229	7229	7229	7229	7229
1.90	.69	.21	.17	.59

7345	7393	7441	7459	7470
7229	7229	7229	7229	7229
1.16	1.64	2.12	2.30	2.41

7498	7517	7571	7687	7831
7229	7229	7229	7229	7229
2.69	2.88	3.42	4.58	6.02

7942	8037
7229	7229
7.13	8.08

2172
869
3041

Zero — Dec - 66.65
Jany — 5366
Feby — 5057
March — 5264
April — 5172
May 5569
June 6042
July — 6361
Aug 7991
Sept 7798
Oct 7710
Nov 7229 -

April Zero Lowest 5172

April	zero	
May	3.97	mm from circle.
June	8.70	"
July	11.89	"
Aug	28.19	"
Sept	26.26	
Oct	25.38	
Nov	20.57	
Dec	14.93	
Jan	1.94	

5366
5172
1.94

5569
5172
3.97

6042
5172
8.70

6361
5172
11.89

7229
5172
20.57

7991
5172
28.19

7798
5172
26.26

7710
5172
25.38

6665
5172
14.93

6.14
16 08
24.22

931
207
11.28

309
920
12.29

February zero - 5057

January	3.09	mm from Earth Circle - Zero
Feby	zero	
March	2.07	
April	1.15	
May	5212	
June	9.85	
July	13.04	
Aug	29.34	
Sept	27.41	
Oct	26 53	
Nov	21 72	
Dec	16.08	

16.08
114
24.22

7229
5057
21.72

5366
5057
3.09

7710
5057
26.53

5264
5057
2.07

5172
5057
1.15

5569
5057
5.12

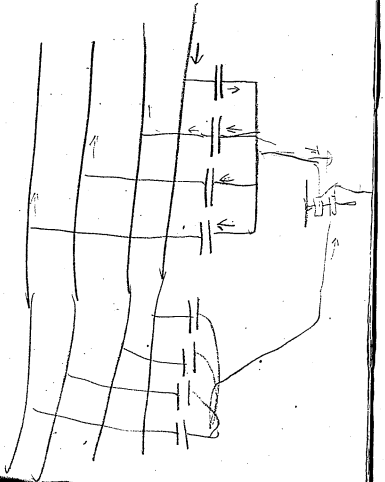
6042
5057
9.85

7991
5057
29.34

6665
5057
16.08

6361
5057
13.04

7798
5057
27.41



Zinc —
Copper
Lead
Tin
Magnesium
Aluminum
Iron

24) 104640 (4360
96
86
72
144
144

872000 (104640
25) 2616000
25
116
100
1500
1500
109 –
8.72

4360

61.
365) 550,000,000 (1506
365
1825
2500
2190
3100
2920
1800
1460
3400

872000
345,600

872000
14
3488000
87200
2300
1344
2656,000

184,000,000

23900

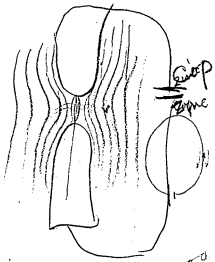
4360) 62743 (14.4
4360
19140
17430
1710
62.743

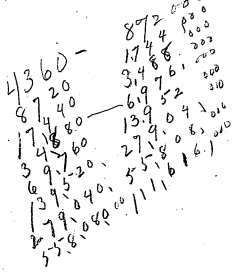
144.4
144.4
656
656
1440
1440

24) 1506,849 (62.743
144
668
48
1488
1488
2069
89

144) 1000 (7.08
1008
1200

872000
872000
87,574,000


Eiop
Same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8720
17440
34880
69760
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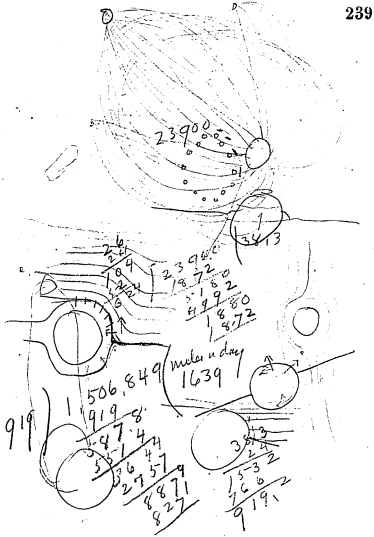
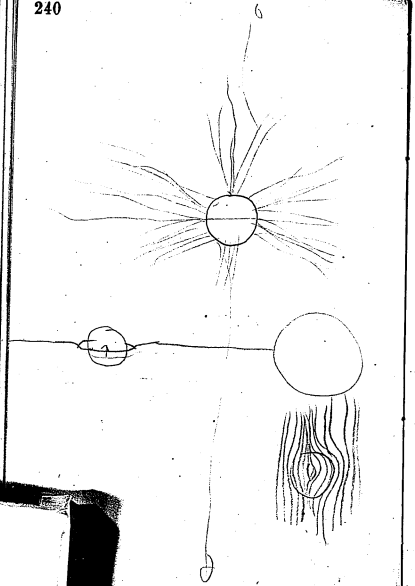
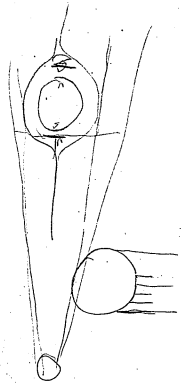
279040
558080
872
1744
3488
6976
13952
27904
55808


23900
3413
1506.849
meter a day
1639
919
1919
3532
1532
919.2





4 ol 10
2 20
4 40
.50 80
.25 160
.12 320
.6 640
.3

103

33.

66.

2

19) 20000 (1052
19
100
95
50

220 bolt
3
660.
8 bolt 60
2

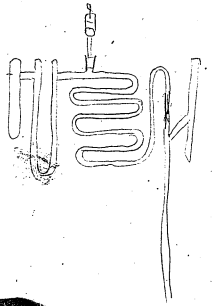
1052.

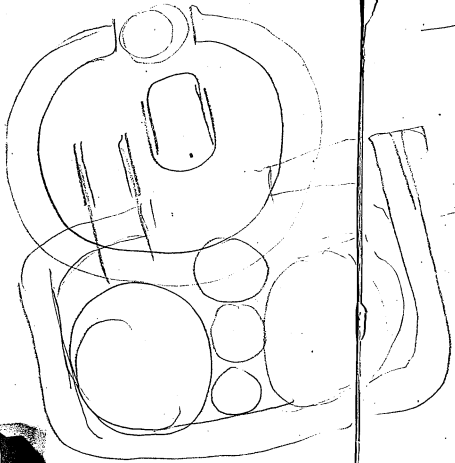
160

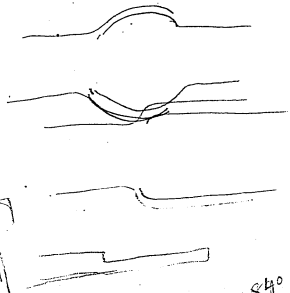
1. 6.50
3550.

25
23
20
10
50.

10. 3.







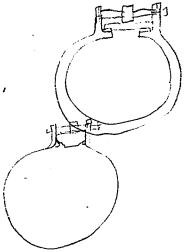
Coffee

Coffee

Coffee

4 36, 360

2360,

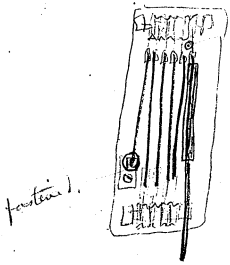


Howard

EdISON NN

3. 15

10 wheels

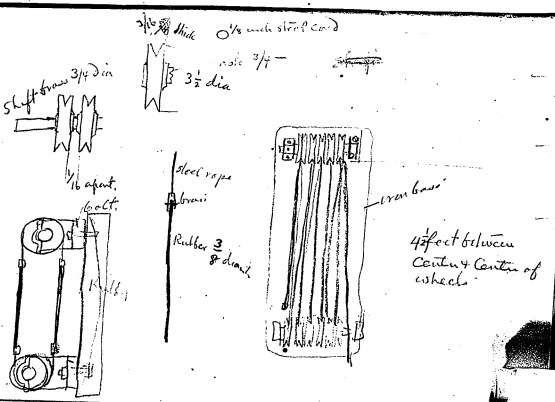


footrest.

wheel

3 feet long 2 inches dia
then brass tube point
full load,

Rod 1/2 dia steel,


3/16 thick
0 1/8 inch steel cord
3 1/2 dia
Shaft brass 3/4 dia
1/16 apart.
Bolt.
Pulley
steel rope
brass
Rubber 3/8 diam.
iron base
4 1/2 feet between
Centre & Centre of
wheels

336. feet 12 inches

212
132
12) 180,(15.
12
60

$\frac{1}{2}$

N-85-10-01